[0215] The dynamic engine can tune and/or optimize (e.g., tone control) the speakers, for example, for the local environment. A microphone can be used to detect a known sample of audio output played through the speakers. The dynamic engine can analyze the detected sample input through the microphone. The analysis by the dynamic engine can be used to alter the audio output, for example, to create a flat frequency response across the frequency spectrum.

[0216] The dynamic engine can create artificial acoustic environments (e.g., office, tank, jet plane, car in traffic).

[0217] The dynamic engine and/or equalizer can adjust the characteristics of the audio output (e.g., gain of frequency range, reverberation) based on audio received during the subject's response to the training. The characteristics of the audio output can be continuously or occasionally adjusted, for example, to accommodate for room size and frequency response.

[0218] Video displays can be used in conjunction with audio to train, for example, for lip reading.

[0219] The parameter module **184** can include meta data, multimedia files, a schedule, or any combination thereof. The meta data can include the text and/or characteristics (e.g., occurrences of each phoneme) for the multimedia files. The multimedia files can include audio files, video files, image files, text files, or combinations thereof. The schedule can include schedules for training including which modules, which characteristics (e.g., phonemes, sibilance), other training delivery data, or combinations thereof.

Method of Training

[0220] **FIG. 33** illustrates a method of training, such as a neurological or audiological training. This method of training can be used in conjunction with other methods described herein.

[0221] An initial assessment **66** of an audiological disorder, such as hearing loss, can be made, for example by a physician during a visit with a patient. The training system **2** can then be initialized. During initialization, a training protocol can be set by the physician and/or by the system **2**. The training system **2** can then be used for training, as described above.

[0222] A training session can be made of numerous training exercises. After a training exercise or set of exercises, the system **2** (e.g., the DSP core and/or processor) can analyze the training results. The training can stop when the training results are sufficient to end the training session (e.g., due to significant improvement, significant worsening, or a sufficient quantity of exercises—any of these limits can be set by the physician and/or the system **2**) or the subject otherwise ends the training session (e.g., manually).

[0223] If the training session does not end, the training protocol can be adjusted based on the analysis of the training results. If the subject is having slower improvement or worsening performance with a particular training module relative to the other training modules, the system **2** can increase the number of exercises the subject performs in that poorly performed module. If a subject is performing poorly with a specific characteristic of a particular module (e.g., sibilance in the competing speech module), the system **2** can increase the incidence of that poorly performing characteristic for future training exercises in the particular module, and/or in other modules.

[0224] The system **2** can make step increases in training delivery characteristics based on subject performance. For example, if the subject performs well, the system **2** can increase the amount of degradation for the degraded speech training module. If the subject performs poorly, the system **2** can decrease the amount of degradation for the degraded speech training module. The step increase can occur after each exercise and/or after a set of exercises, and/or after each session. The step increases can decrease as the system **2** narrows down a range of optimum performance for the subject. The step increases can increase if the subject's performance begins to change rapidly.

[0225] The system **2** can record performance with the corresponding time of day, date, sequential number of exercise (e.g., results recorded and listed by which exercise it was in a particular session, such as first, second, third, etc.), or any combination thereof.

[0226] It is apparent to one skilled in the art that various changes and modifications can be made to this disclosure, and equivalents employed, without departing from the spirit and scope of the invention. Furthermore, synonyms are used throughout this disclosure and are not intended to be limiting. For example, the subject can be equivalent to the patient. Also, numerous species are used as specific examples in lieu of the genus, but any species of that genus disclosed herein can be substituted for the specific example species listed. For example, augmentation, rehabilitation and training can be equivalent, and all of which can be classified as treatments. The aural rehabilitation system **2** and training systems **2** can be equivalents to each other and equivalent to, or a species of, the treatment system **2**. All architectures listed herein can be software and/or hardware. Elements shown with any embodiment are exemplary for the specific embodiment and can be used on other embodiments within this disclosure.

We claim:

1. A system for aural rehabilitation for a subject comprising:

an audio engine, wherein the audio engine is configured to alter a sound data.

2. The system of claim 1, wherein altering a sound data configuration comprises optimizing and/or iterating the sound data based on a subject response.

3. The system of claim 2, wherein optimizing and/or iterating comprises audibly playing the sound data, and wherein the subject responds with input data, and wherein the audio engine alters the sound data in a positive direction or a negative direction based on the input data.

4. The system of claim 3, further comprising a module application, wherein the module application optimizes and/or iterates based on a subject's response.

5. A method for aural rehabilitation comprising:

executing an audio engine and/or module application on a processing hardware,

mixing audio data and noise at a first ratio,

receiving an input, and

mixing audio data and noise at a second ratio.